DC Protection for the IGBT Power Amp

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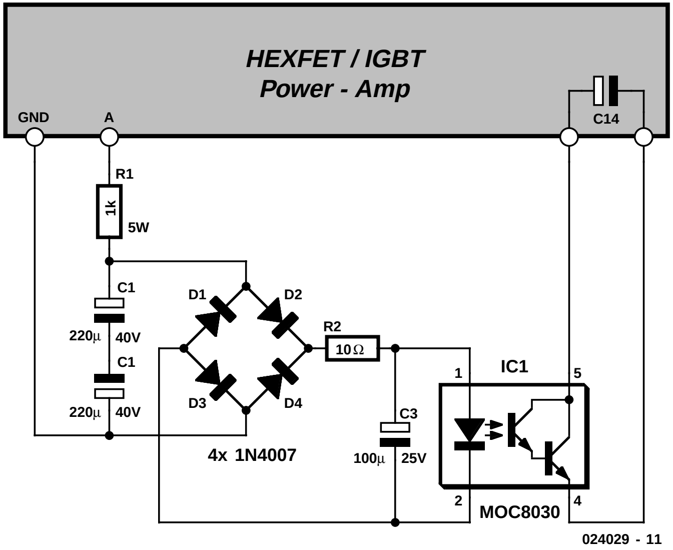
Some time ago, the author built a copy of the IGBT Power Amp, a final amplifier design described in the June 1995 issue of *Elektor Electronics* that has since become a classic. The sound quality provided by the amplifier was more than superb, but it was evident that the output transistors became quite hot during full-power testing (at 140 W). This is not uncommon, of course, but it set an alarm bell ringing, and it was deemed a good idea to at least add DC protection to safeguard the (expensive) amplifier and equally expensive speakers.

The accompanying schematic diagram shows the simplicity the necessary extension, which naturally can also be used with the Hexfet Power AMP described in the November 1993 issue (which is identical in terms of overall design). All that is involved is an optoisolator that monitors output terminal A of the amplifier via a bridge rectifier and series resistor, and whose output is connected in parallel with C14 in the relay control stage. This circuit can be used for all amplifiers up to a DC voltage of 70 V. For higher voltages, the value of R1 must be modified. When a voltage of approximately 2 V_{DC} is present at the input, the phototransistor in IC1 starts to conduct, causing C14 in the amplifier to discharge and disconnect the loudspeaker from the amplifier output by releasing the relay.

If you want to replace the MOC8030 by a different type, be sure to use a Darlington type (or fit an additional transistor) on account of the dynamic range. Also, pay attention to the maximum diode current, which is 80 mA for the MOC8030.

Another incidental point is that the IGBT Power Amp has a tendency to start oscillating if RF1 and RF2 are not low-inductance types or are replaced by other types of low-inductance resistors. In order to eliminate this problem once and for all, the following modification has been developed in the *Elektor Electronics* labs:



- Fit a 27-nF capacitor in parallel with R31 (on the solder side).
- Insert a 20-kΩ resistor between the collector of T8 and ground.
- Change R20 to 1k8.
- Change R17 and R18 to 390 Ω.

– Change R3 and R4 to 33 Ω.

These changes also proved to yield a slight improvement to the original IGBT Power Amp specifications.

(024029-1)